Goodyear ARIZONA	**Solicitation Amendment No. 1** **Solicitation No. 16-3332** **Solicitation Due Date:** September 3, 2015 **Time:** 3:00 pm	Office of Procurement 190 N. Litchfield Road P.O. Box 5100 Goodyear, AZ 85338 Phone: 623-882-7893

High Density Mineral Bond / Slurry Seal

The following pages are replacing the current pages found in the Scope of Work for IFB 16-3332.

Page 25 – 33 have been revised. Replacement pages are attached

No other terms, conditions, or performance standards written or implied are changed.

Procurement Manager: Jacque Behrens, CPPB

City of Goodyear	Approved as to form
By: 8/25/15	By: Risi S. Wahl for
Jacque Behrens, CPPB	Roric Massey, City Attorney

Acknowledgement by Contractor

Contractor hereby acknowledges receipt and understanding of the above amendment. Contractor shall sign and return with their submittal.

Contractor Signature: Date:

HIGH DENSITY MINERAL BOND

PART 1 – GENERAL

1.0 Location of Work:

All work to be located within the City of Goodyear, Maricopa County, Arizona

Proposed Work:

The contract work consists of all necessary labor, material, transportation services and equipment, to perform High Density Mineral Bond Application on City streets per contract specifications. Mineral aggregate and asphalt binder slurry spread as a high density mineral bond seal coat over a roadway surface.

Anticipated Start date: October 2015

1.1 REFERENCES

A. AASHTO R 9: Standard Recommended Practice for Acceptance Sampling Plans for Highway Construction

B. ANSI B74.8: Procedure to Ball Mill Test for Friability of Abrasive Grain

C. ASTM C 128: Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate

D. ASTM C 170: Standard Test Method for Compressive Strength of Dimension Stone

E. ASTM C 1326: Standard Test Method for Knoop Indentation Hardness of Advanced Ceramics

F. ASTM D 1644: Standard Test Method for Nonvolatile Content (Solids by Weight)

G. ASTM D 2172: Standard Test Methods for Quantitative Extraction of Bitumen From Bituminous Paving Mixtures

H. ASTM D 2196: Standard Test Method for Rheological Properties of Non-Newtonian materials by Rotational (Brookfield type) Viscometer

I. ASTM D 2486: Standard Test Method for determining wear resistance in cycles

J. ASTM D 2939: Standard Test Method for Emulsified Bitumens used as Protective Coatings

K. ASTM D 3960: Standard Practice for Determining Volatile Organic Compound Content of Paints and Related Coatings

L. ASTM E 70: Standard Test Method for pH of Aqueous solutions with the Glass Electrode

M. AASHTO T 59: Standard Test Method for Testing Emulsified Asphalts

N. AASHTO T 111: Standard Test Method for Mineral Matter or Ash in Asphalt Materials

1.2 SUBMITTALS

A. Results of wear resistance test current within one calendar year (Article 2.3).
B. Traffic control and notification plan.
C. Mix Design: 10 days prior to use, submit proportions of aggregate, filler, water, polymer, and emulsion in the mix.
D. Equipment: List of construction equipment to be used.
E. Certification from emulsion manufacturer that states the emulsion meets the requirements described in Article 2.1 of this Section.

1.3 QUALITY ASSURANCE

A. Contractor has successfully completed at least five (5) projects of similar size and nature, using the same mix design as described in this section. Upon request, provide a list of five (5) projects which have demonstrated a five year minimum proven performance on a bituminous surface. Acceptable performance after five year period is no less than 70% residual coverage in the treated surface area.
B. Foreman of the crew has completed at least three (3) projects of similar size and nature.
C. Do not change the source of the emulsified asphalt or aggregate without supporting changes in the mix design.
D. Reject asphalt emulsion that does not meet requirements of this contract.
E. Remove product found defective after installation and install acceptable product at no additional cost to City.
F. If requested, submit a quality control inspections and testing report describing source and field quality control activities performed by Contractor and its Suppliers.

1.4 WEATHER

A. Temperature:
1. Apply surface treatment material when air and roadbed temperatures in the shade are 45 deg F. and rising.

2. Do not apply surface treatment material if pavement or air temperature is below 45 deg F. and falling or if the finished product will freeze before 48 hours.

B. Moisture: Do not apply surface treatment materials during rain, unsuitable weather, or 24 hours prior to forecast rain.

1.5 NOTICE

A. Follow laws and regulations concerning when and to whom notices are to be given. Give written notices at least 2 days prior to applying surface treatment material.
B. Indicate application time and when the surface can be used. Include a map signifying the specific area to be closed providing detailed directions.
C. Provide a minimum of two contacts that represent the Contractor with phone numbers which can be reached at any time during the project.
D. Warn of potential vehicle tow away and other construction issues affecting neighborhood.

E. Should work not occur on specified day, send a new notice 48 hours prior to when it is rescheduled.

1.6 ACCEPTANCE

A. General:
1. Acceptance is by Lot.
2. If non-complying material has been installed and no price for the material is specified, apply price adjustment against cost of work requiring complying material as part of its installation, Section 01 29 00.
3. Opening flexible paving surface treatment to vehicular traffic does not constitute acceptance.
4. Observation of Contractor's field quality control testing does not constitute acceptance. Such testing; however, may be used by Engineer for acceptance if requirements of Section 01 35 10 are met.
5. Dispute resolution, Section 01 35 10.

B. Surface Treatment Material:
1. Paving Asphalt: Acceptance is not specified in this Section. Refer to Section 32 12 03 and the material requirements in this Section for acceptance.
2. Aggregate Source: Verify suitability of aggregate source.
3. Mixture, Ready to Install: Lot size is one days' production with 10,000 gallons sub-lots. Collect samples randomly and test for density, ASTM D2939.

C. Placement
1. Lot size is 1 lane mile. Sub-lot size is 0.1 lane mile.
2. Mat Appearance:
   a. No runoff onto concrete curbs and shoulders.
   b. No streaking.
   c. No light spots.
   d. No de-bonding due to road contaminants.

D. Price Adjustment: Mat appearance defects may be accepted if a 2.5 percent price reduction is applied against the Lot for each condition not met. Maximum price reduction for the Lot is 5 percent. Engineer may waive price adjustment if Contractor corrects deficiencies at no additional cost to City.

1.7 WARRANTY

The surface treatment material must carry a warranty from both the Contractor and the manufacturer for a period of five (5) years when applied to pavement in appropriate condition. The warranty includes coverage for peeling and pre-mature wear. Acceptable performance after five year period is no less than 70% residual coverage in the treated surface area.

PART 2 – MATERIALS

Use the following table as a guide for HDMB in CONCENTRATE Form.

2.1 HIGH DENSITY MINERAL BOND BASE EMULSIFIED ASPHALT

A. Non-ionic base emulsion used in High Density Mineral Bond, at 77 Deg. F., must meet the requirements of Table 1 below.

Table 1

Non-Ionic Emulsion – Emulsifier Type: Inorganic*			
Criteria	**ASTM/AASHTO METHOD**	**Specification**	**Unit**
Brookfield Viscosity at 77 °F (Spindle 5, 20 rpm)	D2196	11,000 – 20,000	cPs
pH	E70	5.0 – 7.5	pH
Density	T59	8.5 – 9.0	lbs/gal
Solids Content	T59	50.0 - 54.0	%, by weight
Ash Content	T111	4.0 – 6.0	%, by weight
*Inorganic is defined as a non-carbon-based emulsifier			

2.2 AGGREGATE

A. Slate:

Table 2

Slate			
Criteria	**ASTM Method**	**Specification**	**Unit**
Specific gravity	C128	>2.6	--
Compression	C170	*11,000 min*	psi

A. Refined Corundum

Table 3

Refined Corundum		
Criteria	**ASTM Method**	**Specification**
Specific Gravity	C128	> 3.9
Knoop 100 Hardness	C1326	> 2,000
Ball Mill Fiability	**ANSI B74.8**	**50 (14 grit)**

2.3 COMPLETED HIGH DENSITY MINERAL BOND MIX DESIGN

A. Completed High Density Mineral Bond material, prior to being loaded for install must meet the requirements in Table 6 below:

Table 6

Criterion	ASTM/AASHTO Method	Specification	Unit
Asphalt Content	D2172	17.0 – 20.0	%, by weight
Solids Content	D1644	55.0 – 63.0	%, by weight
Initial Brookfield Viscosity at 77°F (Spindle 4, 20 rpm)	D2196	5,500 – 9,000	cPs
Ash Content	C2939	> 38.0	%, by weight
Ash Content of Solids	T111[1]	> 65.0	%, by weight
Density	T59	> 11.0	lbs/gal
pH	E70	6.0 – 8.0	
Total Inorganic Aggregate Content	T111[2]	> 37.0	%, by weight
Total Sand Content		< 6.0	%, by weight
Maximum VOC	D3960	< 5.0	g/l
Resistance to Re-emulsification	D2939	No Re-emulsification	--
Wear Resistance	D2486 Modified[3]	< 4.0 %	% loss, by weight

1. Ash Content as a percentage of Solids Content.
2. Ash Content of completed HDMB minus Ash Content of HDMB Base Non-Ionic Emulsion. Total Inorganic Aggregate Content defined as slate, refined corundum, and sand.
3. ASTM D2486 (Modified): Prepare samples at 48 Wet Mils on glass panel. Dry at 77 □F for 3 days. Immerse in water for 24 hours at 77 □F. Test scrub resistance with 1,000 gram brass brush for 12,000 cycles. Report % of dry film lost.

PART 3 - EXECUTION

3.1 CONSTRUCTION EQUIPMENT

A. Asphalt Distributor: Continuous flow mixing unit.
   a. Capable of applying at least 15,000 square yards of material per day.
   b. Equipped with full sweep helical mixer to assure proper suspension of fine aggregates.
   c. Equipped with two separate filters. The primary filter should be at least 200 square inches with a filter face of 3/8 inch. The secondary filter needs to be at least 1500 square inches with a filter face of 1/8 inch.
   d. Has a retractable spray bar with spacing of 16 inches between each discharge orifice. The bar should be positioned minimum of 20 inches from the surface, no more than 23 inches from the surface.
   e. The contractor shall have a minimum of two fully operational mixing units at the project site at all times.

B. Asphalt Distributor Calibration: On a test strip at least 300 feet long, determine the correct pump settings on the application equipment. Apply material with pump settings at 80% of maximum output at a ground speed of 352 feet per minute.
   a. These distributors shall be available for inspection by the City at least 48 hours prior to commencing

work.

3.2 PREPARATION

A. General:
   a. Severely raveled or porous pavements may require tack coat.
   b. Asphalt concrete inlay may be required in rut deformations.
B. Surface Repair: Patch any holes, raveled areas, and low areas with asphalt concrete.
C. Crack Repair: Section 32 01 17.
   a. Remove plant materials from cracks, edges, gutter lines and joints.
   b. Clean cracks with compressed air and vacuum unit.
   c. Seal cracks with hot pour crack sealant. Material shall be squeegeed into the cracks removing excess material.
   d. Allow crack seal to cure before applying surface treatment material.
   e. Cracks larger than ¾" are to be sealed with Crafco Poly Patch or approved equivalent.
D. Traffic markings: Grind off existing pavement markings and lane striping that may prevent the adhesion of the material to the asphalt surface. Use reflective tabs to mark striping location before applying surface treatment material.
E. Cleaning:
   a. Remove loose material, mud spots, sand, dust, oil, vegetation and other objectionable material.
   b. Do not flush water over cracks or apply pressurized water to cracked pavement.
   c. Clean the surface immediately prior to installation.
F. Tack Coat:
   a. Apply tack coat to high absorbent, polished, oxidized, or raveled asphalt surfaces or to concrete or brick surfaces.
   b. Tack coat should consist of one part emulsified asphalt, three parts water and should be SS or CSS grade.

3.3 PROTECTION

A. Implement the traffic control plan requirements. Provide safe passage for pedestrians and vehicles. Do not proceed without flaggers.
B. Protect trees, plants, and other ground cover from damage.
C. Prune trees to allow equipment passage underneath, Section 32 01 93. Repair tree damage at no additional cost to City.
D. Install invert covers, Section 01 71 13.
E. Mask off end of streets and intersection to provide straight lines:
   a. Make straight lines along lip of gutters and shoulders. Keep same thickness in these areas. No runoff on these areas will be permitted.
   b. Vary edge lines no more than 1/2 inch per 100 feet.
F. Protect curb, gutter, and sidewalk from spatter, mar, or overcoat.
G. Protect surface treatment materials from traffic until it has cured.

3.4 APPLICATION

A. Application Rate: Two separate applications coats are required. The first application must be thoroughly dry and free of any damp areas before the second application begins. Machine settings must

match the following application rates.
a. 0.20 gallons per square yard minimum.
b. 0.16 gallons per square yard minimum.

B. Spreading:
a. Keep constant delivery rate of material per square yard of surface, even if the forward speed of the machine varies.
b. Do not reduce application rate along edges or around manhole covers.
c. Apply both applications right to the edge of the pavement. Do not back away from curbs, manhole covers, and edges on either application.

3.5 AFTER APPLICATION

A. Leave no streaks caused by plugged nozzle or improper spray bar height.
B. Leave no holes, bare spots, or cracks.
C. Expose and clean Manholes, valve boxes, inlets and other service entrances and Street Fixtures.
D. Raise reflective tabs that were covered over. This will aid roadway users in finding lane delineation after installation and before permanent striping.
E. Do not permit traffic on product until surface has cured (minimum 8 hours).
F. Do not apply permanent lane marking or paint until placement has aged at least 10 days and layout has been verified with Engineer.

3.6 FIELD QUALITY CONTROL

A. Testing: If density tests (ASTM D2939) show non-compliance, remove the product and halt operations until new material arrives and is shown to be in compliance. Measure the total amounts of material installed, and verify it meets the application rate.
B. Protect surface treatment material from traffic until it has cured.

3.7 REPAIR

A. Remove spatter and mar from curb and gutter, sidewalk, guard rails and guide posts at no additional cost to the City.
B. Remove surface treatment material from Street Fixtures
C. Make correction lines straight. Provide good appearance.
D. Leave no streaks, holes, bare spots, or cracks through which liquids or foreign matter could penetrate to the underlying pavement.
E. Repair collateral damage caused by construction.

3.8 Traffic Control

A. Traffic Control: All traffic affected by this construction shall be regulated in accordance with the City of Phoenix "Traffic Barricade Manual," and these Special Provisions. The following traffic restrictions are minimum requirements throughout the construction period: For the purpose of this project the contractor will be strategically closing segments of roadway in order to limit the impact to the residents. The contractor will be responsible for preparing a notice for each location that includes a full description of the project and color map with instructions of what roadways will be closed on what day and where

residents can park. Contact information for the contractor's representatives that will be on site at all times shall be included on the notice. A sample notice will be provided to the bidder upon request. A representative shall be on site at all times equipped with a golf cart to transport residents to and from their houses if needed do to disabilities or workloads. Advanced meetings with the neighborhoods may be necessary to provide adequate communication.

B. Traffic Control and Project Schedule

C. Contractor shall submit all traffic control plans and neighborhood notices five (5) days in advance of the project pre-construction meeting.

D. The Project Manager will review and approve no later than three (3) days before the project pre-construction meeting.

E. Final traffic control plans, approved neighborhood notices and the project schedule shall be submitted to the City one day before the scheduled project pre-construction meeting.

F. The Project Manager shall send the notice to proceed immediately after the project pre-construction meeting. Work may not commence until the notice to proceed has been approved and the notice has been sent.

3.9 MEASUREMENT

a. High Density Mineral Bond seal will be measured and paid for by the square yard for the actual surface areas covered.

B. The Contractor shall be responsible for verifying the measurement for each area and to provide this area measurements to the City prior to bidding the project.

3.10 PAYMENT

A. The contract price paid per square yard for High Density Mineral Bond seal shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in the furnishing and placing of the High Density Mineral Bond complete in place, based on quantity bid, traffic control, including cleaning the surface and protecting the High Density Mineral Bond seal until it has set, all as shown on the plans, as specified in these specifications and as directed by the Project Manager. Alternative bids will be per the additional table listed below.

Page 33 - Intentionally left black